

Simulation of Precipitation and Riverflow for the Russian River during the January 1995 California Flood



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Simulated precipitation and riverflow over the Russian River basin during the 12-day storm event of January 1995 in California are presented. Heavy precipitation during this period caused severe flooding along the Russian River.

The LLNL operational Coupled Atmosphere-Riverflow Simulation (CARS) system, which is composed of a primitive-equation Mesoscale Atmospheric Simulation (MAS) model, LLNL Land Analysis System (LAS), and the USGS's version of TOPMODEL, was used to simulate precipitation and riverflow. The MAS model predicts regional precipitation and atmospheric flows at 20 km resolution using the large-scale forecast or analysis data, which were obtained from 80 km resolution NMC ETA model results. The LAS provides the area and boundary of target watersheds, in this case, the Russian River Basin north of Hopland gauging station, and TOPMODEL computes riverflow as a process physics calculation using the simulated watershed-mean variables.

The simulated local precipitation and riverflow during this 12-day study period agrees well with the observations provided by the California River Forecast Center. The simulated precipitation was in good agreement with the available single raingauge observations, and the simulated riverflow during the flooding stage differed from the observed riverflow was within 80% of the observed riverflow. The CARS system is being implemented over major California watersheds as part of an experimental forecast and water resources study.

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